

Breeding together, wintering oceans apart: divergent migratory movements of thick-billed and common murres from St Lawrence Island, Northern Bering Sea

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As seabirds often face relatively high mortality during the non-breeding period, it is important to determine species-specific wintering areas to better understand the effect of environmental changes on their populations. Sympatric seabird species have been reported to show diverging diets, foraging ranges, and/or diving depths during the summer breeding period. In contrast, we are only just starting to discover the differences in the movements and foraging behavior of sympatric seabirds during the non-breeding period. In the Arctic and subarctic regions, closely-related thick-billed (*Uria lomvia*) and common (*U. aalge*) murres are among the most numerous seabirds, often breeding in mixed colonies. Here we examined the migratory movements and diving behavior of these birds breeding on St Lawrence Island, in the Northern Bering Sea. During the breeding seasons of 2016 – 2018, we deployed light-based geolocators with depth sensors. Due to low recovery and high failure rates of the geolocators, we were able to track the movements of only a small number of birds ($n = 3$, for each species). Thus, we also inferred winter locations based on stable isotope signatures of feathers obtained from these tracked and a large number of untracked individuals of both species. Geolocator results, generally supported by those based on the stable isotope analysis of feathers, showed that the two species had markedly different migratory movements. Thick-billed murres first moved into the Chukchi Sea in autumn, and then moved southwest to the Sea of Okhotsk and Japan Sea in winter, before returning to the Northern Bering Sea in May. In contrast, common murres stayed in the Northern Bering Sea in autumn, and moved to the Southeastern Bering Sea and areas of the North Pacific, south of the Aleutian Islands, in winter. Diving data suggested that thick-billed murres performed mostly benthic dives over the shallow shelf of the Chukchi Sea in autumn, while common murres performed mainly pelagic dives throughout the non-breeding period. Inter-specific differences in isotopic signatures of primary and throat feathers, molted in autumn and late winter respectively, suggest that these different migratory patterns persist across years. These results suggest that the two species of murres from St Lawrence Island experience markedly different oceanographic environments during the non-breeding period, especially in winter, which may differentially affect their ability to withstand the rapid changes occurring in the Pacific Arctic ecosystem.